Subject: speeding up code for fitting spectra for doppler map
Posted by Krishna Mooroogen on Tue, 08 Mar 2016 18:37:46 GMT
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Hi,

I'm new to using the IDL google groups so please forgive me if my question is not formatted to the norm.

I have written some code to create doppler images from a 4d image array (x,y,w,t) where w is the wavelength. Currently, the code takes nearly 3 hours to make one frame of the doppler image. I have 79 frames!

To do this, I loop over each pixel in the image and fit a function to the spectra found in each pixel to find the centroid, the central peak position is important to make the doppler map.

I use a rudimentary peak finding algorithm at the start to find the peaks as the profile shifts around from pixel to pixel and sometimes flattens out. Then fit a function around the peak.

I have clauses that change the start parameters if the fit is not satisfactory and also to record positions that could not be fitted. I would like to retain these features if possible.

Below is the code in question. In this version, it is set up to do a single frame and so I do not loop in time just in position. If anyone has any ideas how I can speed up the procedure I will be very grateful! I am using IDL 7.

```
pro vel_map3,data,map,coords

sz=size(data)

 x=([-0.29000000,-0.21700000,-0.14500000,-0.073000000,0.00000
00,0.073000000,0.14500000,0.21700000,0.29000000]+8542)/10.0

coords=0

map=fltarr(861, 481, /nozero)
grad=190000

FOR j=0   , sz(2)-1     DO BEGIN
FOR e=0 , sz(1)-1     DO BEGIN

d_cut=reform(data[e,j,3:11])
const=max(d_cut)
d_cut=d_cut-const

FOR i=2, 6 DO BEGIN
minval=min(d_cut[i-2:i+2],xi)
;Wait till maximum is at centre of search bar
```

```
IF xi EQ 2 THEN BEGIN
in=i
BREAK
ENDIF
in=i
ENDFOR

res1=(d_cut[in]-d_cut[in-2])/(x[in]-x[in-2])
res2=(d_cut[in+2]-d_cut[in])/(x[in+2]-x[in])

IF (res1 LT -1*grad) AND (res2 GT grad) AND (xi EQ 2) THEN BEGIN

x2=x[in-2:in+2]
d2=d_cut[in-2:in+2]
der=sqrt(d2)

cent=total(double(d2)^2*x2)/total(double(d2)^2)

p=[min(d2,n),cent,0.8,600]

 f=mpfitpeak(x2,d2,res,nterms=4,errors=der,estimates=p,perror
=perr,/quiet,/moffat,/negative,chisq=chi)

IF chi GT 1e8 THEN BEGIN
p[2]=0.6
 f=mpfitpeak(x2,d2,res,nterms=4,errors=der,estimates=p,perror
=perr,/quiet,/moffat,/negative,chisq=chi)
ENDIF

IF chi GT 1e8 THEN BEGIN
p[2]=0.5
 f=mpfitpeak(x2,d2,res,nterms=4,errors=der,estimates=p,perror
=perr,/quiet,/moffat,/negative,chisq=chi)
ENDIF

map[e,j]=res(1)

ENDIF ELSE BEGIN
coords=[temporary(coords),e,j]

ENDELSE
ENDFOR
ENDFOR

coords=coords[1:*]

END
```